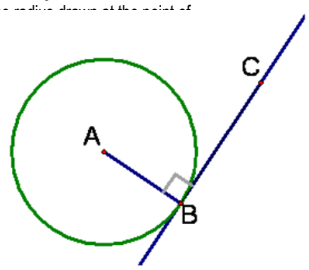
11-2
Properties of Tangents

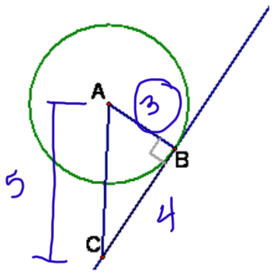
Theorem 11.1-If a line is tangent to a circle, then it is perpendicular to the radius drawn at the point of tangency.



Theorem 11.2-In a plane, if a line is perpendicular to the radius of a circle at its endpoint on the circle, then the line is tangent to the circle.

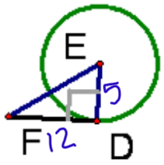
Find the radius if AC = 5 and BC = 4

$c^2 = a^2 + b^2$
$5^2 = 4^2 + b^2$
$25 = 16 + b^2$
$9 = b^2$
$3 = b$



Find EF, if DE = 5 and DF = 12.

$c^2 = 5^2 + 12^2$
$25 + 144$
169
$c = 13 = EF$



$(x+5)^2$ FOIL

$(x+5)(x+5)$

$x^2+5x+5x+25$

$x^2+10x+25$

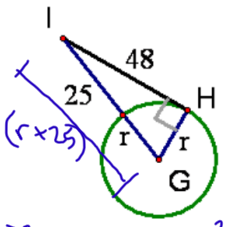
$(x+7)^2$

$(x+7)(x+7)$

$x^2+7x+7x+49$

$x^2+14x+49$

Find r.



$(r+25)^2 = r^2+48^2$

$(r+25)(r+25) = r^2+2304$

$r^2+25r+25r+625 = r^2+2304$

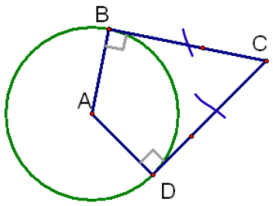
$r^2+50r+625 = r^2+2304$

$50r = 1679$

$r = 33.58$

Theorem 11.3-If two segments from the same outside of a circle are tangent to the circle, then they are congruent.

BC = CD



$\overline{BC}$ and $\overline{DC}$ are tangent to $\odot A$

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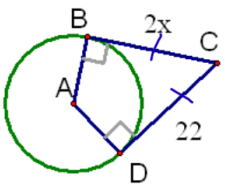
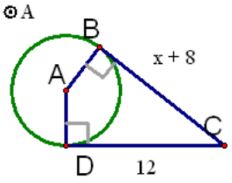


$2x = 22$

$x = 11$

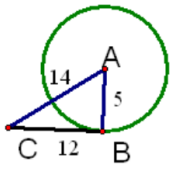
$\overline{BC}$ and $\overline{DC}$ are tangent to ⊙A



$x+8=12$

$x=4$

Is $\overline{CB}$ a tangent?



Check Pyth Thm.

$14^2 \stackrel{?}{=} 5^2+12^2$

$196 \neq 25+144$

No

HW

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